

This article was downloaded by: [Consorti de Biblioteques Universitaries de Catalunya]

On: 1 December 2010

Access details: Access Details: [subscription number 789296667]

Publisher Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Education, Communication & Information

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713618988>

Virtuality and the Shaping of Educational Communities

Robin Goodfellow^a

^a Institute of Educational Technology, Open University, UK

To cite this Article Goodfellow, Robin(2005) 'Virtuality and the Shaping of Educational Communities', Education, Communication & Information, 5: 2, 113 — 129

To link to this Article: DOI: 10.1080/14636310500185802

URL: <http://dx.doi.org/10.1080/14636310500185802>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Virtuality and the Shaping of Educational Communities

ROBIN GOODFELLOW, *Institute of Educational Technology, Open University, UK*

ABSTRACT *This paper considers the relation between educational institutions, the learning communities that 'inhabit' them and the virtual spaces into which many of these communities are currently expanding. It explores, through a review of the literature on virtual community and its implementation in a variety of educational contexts, the idea that the practices of virtual communication and the social practices that give rise to learning communities are involved in a reciprocally shaping relationship which is not always acknowledged in the discourses of online learning. It argues that educationists should study the social practices of virtual learning communities, as well as the interactions of their participants, in order to ensure that communities are properly inclusive. It proposes that situated and virtual activities and events should both be viewed as textually mediated literacies, so as to enable their mutual shaping to be described.*

Education, Learning Communities and Social Shaping

Many writers have reflected on the variety of meanings that the word 'community' can express, and the difficulty of analysing its characteristics (Jones, 1998; Burbules, 2000; Hamman, 2001). It is, nonetheless, a concept that figures significantly in educational research and practice in both physically located and virtual contexts. For example, it features in studies in adult education (Russell, 1999; McClenaghan, 2000), cross-cultural and bilingual education in schools (Shields & Seltzer, 1997; Merryfield, 2003), the relation between community, work and family (Crow *et al.*, 2001; Voydanoff, 2001), the professional development of teachers (Grossman *et al.*, 2001; Schlager *et al.*, 2002), and of course extensively in distance learning in higher education (Lally & Barrett, 1999; Brown, 2001; Moodley, 2002; Swan, 2002, etc.).

In much of this work, 'community' is contextualised by evidently existing social structures such as families and neighbourhoods, institutions such as schools and colleges, corporate entities such as businesses and administrations. These are

the physical and interactional settings for the individual and collective behaviour and relationships which the concept of community refers to. In the virtual context, however, 'community' is a construction placed on activity that is achieved entirely through the technologies of remote communication. In this case, the behaviour and relationships of community members are considered not to be directly related to their physical locations. Still, the continued use of the term 'community' to describe these interactions implies some level of stability or enduring significance which is comparable to that conferred by place in the case of located communities.

Research and development in online learning over the last two decades has tended to minimise the importance of the physical setting of learning, whilst at the same time maximising the social significance of remote 'presence' (Gunawardena, 1995; Garrison & Anderson, 2003). It has constructed virtual educational spaces as 'unique' domains characterised by a potential for peer collaboration and the democratisation of the teacher-student relationship (Harasim, 1993; Hiltz, 1994; Bonk & King, 1998; Paloff & Pratt, 1999; Swan, 2002). Today, despite the growing costs of investment in appropriate technologies, educators, instructional designers, developers and pedagogues in schools and universities continue to look to the virtual domain and to the ideal of community for a new form of place-independent social and collaborative learning.

In part this can be seen as a practical response to the challenges of flexible and distance learning, which are now seen as a priority in the post-compulsory education sector. Hakken argues, for example, that some kind of deliberately engineered 'performance' of community may be a necessary component of any knowledge networking effort that is in some sense 'de-placed', because it is the only way to ensure 'buy-in' or the commitment of participants (Hakken, 2002, pp. 357-358). In part it is also due to the prominent involvement in online course development of what Wallace calls 'researchers who are "seeped in" theories of learning which emphasise social interaction' (Wallace, 2003, p. 261). From a theoretical perspective which conceptualises new technologies primarily as tools for communication and collaboration, the opportunities that the medium affords are wasted if they do not potentially lead to the creation of a community of learners (Wallace, 2003).

But one can also detect, in some of the more Deweyan (Leander & Duncan, 2004) conceptualisations of online learning (i.e. those which foreground its democratic credentials), an ideological dimension inherited from the pioneer era of virtuality and community (Rheingold, 1993). This rhetoric has constructed online community in terms of a 'global village', valorising the freeing of social interaction from geography. According to this view, online interaction is characterised by the elimination of personal inequalities, free speech and the transcending of culturally specific values that hinder communication, free exchange and shared understanding (cf. Hawisher & Selfe, 2000, p. 8).

This notion that the physical connection between learning communities and the social institutions which have previously been their setting can be broken, echoes a tradition in radical educational discourse which sets institutions and communities in opposition (Goodman, 1964; Illich, 1976). It can be argued that existing social structures and educational institutions rarely reflect the kinds of

relationships and interactions that the ideal of community implies. Marsh and Richards propose, for example, that a true socially inclusive 'community of learners' can only be achieved through the 'complete deconstruction of present institutions of higher education' (Marsh & Richards, 2001, p. 447). Virtuality might therefore be seen as a way for learning communities to achieve independence from institutional control, as Wiley suggests in his discussion of the differences in power structure between online courses and 'decentralised communities' of practitioners on the Internet (Wiley, 2002, see below). But it is equally possible that the weakening of ties with established institutions could put communities at risk from the more arbitrary forces of globalisation. As some writers from developing countries have argued, deregulation, as a product of neo-liberal politics, economic rationalism and new technologies, now constitutes a major threat to the historic commitment of national systems of open and distance education to the educational cause of the socially marginalised (Dikshit *et al.*, 2002). The role of educational institutions in shaping the conditions, either physical or virtual, of their learning communities is complex therefore, and cannot be deconstructed or ignored simply because the place-based social context is invisible online.

The focus of this paper is this shaping relation between educational institutions, the learning communities that 'inhabit' them and the virtual spaces into which these communities are expanding. This is a relationship that has been little explored in the literature of online learning. In talking about the shaping of communities and institutions through the introduction of new technologies one is not describing a purely linear process. In the interaction between social factors and emerging technologies, neither is necessarily causally prior (Woolgar, 2003). 'Social shaping' in fact describes a process of mutual elaboration, in which patterns of take-up, use and evaluation interact with features of design and technical infrastructure in the co-production of new socio-technical practices (Russell & Williams, 2002; Woolgar, 2003). It is an increasingly common experience, for people in the 'knowledge work' sectors of developed economies, to engage in social communication and work practices which are predominantly virtual (personal interaction through e-mail and via lists and bulletin boards, e-commerce, online research, chat groups, online teaching and learning, etc. See for example Cooper *et al.*, 2002). This has happened not simply because the technology was available, but also because of an increasing overlap between work practices and domestic life (Russell & Williams, 2002, p. 5). The shaping of educational practice through the experience of virtuality and the shaping of network technologies through the practices of learning communities should therefore be a reciprocal one. But what are its key elements? And how is it played out in the practices of virtual learning communities? In the following discussion we consider the nature of community in virtual space—the subjective perceptions and objective practices that emerge from this particularly technical form of interaction, and we discuss the educational character of communities which form online for the purposes of learning—the technical configurations and practices that emerge from this particularly social objective. This overview provides a perspective from which to argue the need for research in online learning to take account of the wider practices of the educational communities and institutions that are their social context.

The Nature of Virtual Community

The ideological basis for the concept of community is well recognised. As Burbules points out:

The existence of a 'community' is not a given...but a claim, a proposal, that is bounded by a set of conditions and practices that have given rise to it. (Burbules, 2000, p. 328)

Burbules goes on to say that the discourse of community is 'wrapped up in...a "warmly persuasive mood"' (p. 328). This is certainly true for the virtual realm, from Rheingold's whimsical notion of online community as 'Homesteading on the Electronic Frontier' (Rheingold, 1993), to the two and a half million English-language web pages describing 'online communities' that can be found on the Web today through a simple search with these keywords. As Preece notes, thousands of these hopeful communities are launched on the Internet every day, although many falter or disappear without trace (Preece, 2000). In the informal, western-dominated environment of the Internet at large we might say that the term 'online community' has become a key signifier of the humanity behind the technology, islands of sociability in the otherwise chaotic universe of information.

Rheingold's claim that electronic interaction is just like its physical equivalent: 'people in virtual communities do just about everything people do in real life, but we leave our bodies behind' (Rheingold, 1993, p. 3) has led to the notion of community 'emerging' out of interpersonal interaction online (Baym, 1998, p. 35). It is formed out of a subjective sense, 'a feeling that members have, of belonging...that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together' (Wilson, 2001). It is characterised by belonging, trust, expected benefit, and obligation, leading to what Wellman and Gulia call 'neighbourhood-like group communities of densely-knit ties' (Wellman & Gulia, 1999, p. 187).

But the claim for the existence of community online does not rest solely on subjectivity. There are other, more immediately observable, characteristics of sustained and collective virtual interaction which have been identified in the research literature as contributing to the emergence, or co-construction, of community. An online community may be described as a network of interaction (Haythornthwaite, 2002), around, for example, sharing and cooperation over the use of 'public goods'. Virtual public goods are made up of different forms of information: software tools, resources, data, commentary and advice. These goods are characteristically 'non-rival', meaning that one person's possession of them does not render them unavailable to others, and being digital their cost of distribution is close to zero. Kollock (1999, p. 228) explains the readiness of people to contribute such products of value for public use on the Internet by their expectation of some sort of generalised reciprocation either in kind or in regard. They may anticipate similar favours from others, or their standing in the community may be increased, a group or individual need may be met, or people may simply be expressing attachment or commitment to the group.

Virtual communities are also characterised by shared stories, jokes, jargon and shortcuts to communication. These kinds of signs and language behaviours are part of a communicative repertoire which members use not only to negotiate meaning but also to signify membership. Online communities vary their linguistic repertoires in response to features of the technology as well as of the participants and their social practices. Synchronous communication (e.g. chat rooms), for example, tends to favour linguistic structures associated with economy of effort, such as deleting subject pronouns and other abbreviated forms of expression. Asynchronous messaging, on the other hand, often makes use of conventions of addressing people by name, or 'quoting' previous contributions (through the automatic, or deliberate, pasting of text from one message into the response to it), or other means of formally identifying the discourse community (Herring, 2001). These linguistic and textual behaviours also provide the means for the exercise of social control. Whilst online communities may be free from some of the systems of control that apply in the physical world (e.g. dress codes), and thus appear to be more democratic than their place-based equivalents, the regulation of power and status within a virtual community is part of what sustains it, just as it is within the conventional kind. Most long-term online communities operate some system of control over unwanted behaviour: from 'administrator control', where those with technical control over access act as arbiters of continuing participation, to 'community control', where standards are enforced by internal pressure from the membership.

Membership of an online community is not just a matter of belonging to an organisation, having a title or having personal relations with some people, but involves patterns of participation and non-participation in practice. Some online communities require newcomers to demonstrate their fitness to join, as well as the sincerity of their interest, by creating a representation of themselves, a textual description, or selection of an avatar (a graphical image, usually a face, which can be used to represent an individual). In others, choice of online names, frequency of posting and use of signature files (a short text containing homilies, quotations or images drawn in alphanumeric characters, that is attached to the end of every message as a way of projecting an identity over a period of time) are indicators of processes of personal identification that develop over time. The development of such trajectories can signify shifts in patterns of dominance and even in ownership of an online community. Mozzon-McPherson (1998) provides an example from an online group that was initially set up for students on a university Italian language course, but was eventually taken over by international speakers of Italian who imposed their own cultural and linguistic norms for core membership of the community.

Virtual community therefore resides in both the subjective experience and in the observable patterns of practice of participants in online interaction. The two are not inseparable, clearly the sense of community could exist for some participants in a particular virtual group but not for others. As Burbules argues, 'Community' is a claim made by certain groups, for certain purposes, and this can result in the inclusion of some and the exclusion of others (Burbules, 2000, p. 328). Hodgson and Reynolds (2002) take up this argument, challenging the value placed on consensus

and social solidarity, and the whole notion of 'community as sentiment'. Virtual communities, they claim, need to support the recognition of differences as they emerge, making these differences central to the life and learning of the participants. If they do not, exclusion and marginalisation may result, and this will almost certainly mean that people simply absent themselves from any further interaction. Such precariousness of existence is what some writers have pointed to as a key difference between communities rooted in physical and virtual reality. A community that can simply be 'zapped' from the desktop is unlikely to engender the same level of commitment as one that it takes sustained effort to escape from (Doheny-Farina, 1996). Dreyfuss too (2001) has argued that embodiment may be an essential condition of certain levels of engagement crucial to enculturation. However, it is safe to say that these arguments have had little impact on the willingness of educationists to promote the idea of the virtual community as a paradigm for learning in the information age.

Virtual Learning Communities

With its emphasis on subjective engagement, and its 'liberational' ideological subtext, the post-Rheingoldian valorisation of community in virtual settings has transferred significantly to educational practice in western formal and informal contexts. However, the conceptualisations of learning with which it is associated vary quite considerably. At one extreme the 'homesteading' metaphor translates into a vision of a deinstitutionalised, naturally emerging form of self-education through mutual engagement, as Wilson and Ryder propose, for example, in their account of purposeful, self-sustaining 'dynamic learning communities', as the alternative to instructionally designed systems (Wilson & Ryder, 1996). Further along the spectrum of structure and control, organisers of formally constituted online courses, in both face-to-face and distance teaching contexts, seek to use virtual communities to motivate individual learning through the promotion of sociability and group cohesion (Paloff & Pratt, 1999; Garrison & Anderson, 2003). Beyond formal education, in professional development and the business training world, attempts are being made to design virtual communities as vehicles for the development and dissemination of knowledge across widely distributed networks of practitioners (Cothrel & Williams, 1999; Barab *et al.*, 2001). And in the arena of civic community, virtuality and the networking of neighbourhoods is part of a contemporary approach to redressing educational disadvantage and social hardship (Schuler, 2001; Meredyth *et al.*, 2002). If we look at some examples from each of these areas in turn we can see how technical and social contexts interact to shape the kinds of community that emerge and the characteristic learning that results.

Decentralised Learning Communities

Wiley (2002) has elaborated Wilson and Ryder's idea of the dynamic learning community (see above), to describe groups of computer technologists who use the Internet to support each other in learning about new developments, by exchanging

reusable digital resources such as 'news stories', reviews and summaries of information derived from the Web at large (Wiley, 2002, p. 21). Wiley calls these groups 'decentralised' learning communities in order to draw attention to the way that the content and control of the community's business are distributed across a large number of active moderators, who are themselves subject to peer review by the community at large. What distinguishes a group of this kind from both an online 'course' and an Internet discussion group, is the fact that participants are engaged in the solution of real-life issues drawn from their occupational contexts, and the fact that their learning 'agenda' and their internal systems of social control are developed by the participants themselves, not by any accrediting institution or process of external validation. These factors are what makes them decentralised communities. That they are involved in learning as engagement-in-practice in the manner described by Wenger (1998) and other theorists of situated learning (Lave, 1993; Barab & Duffy, 2000) suggests that they could be described as 'communities of practice', although the distributed nature of their mutual engagement and the generality of their joint enterprise (to learn about new information technology [IT] developments) makes them quite unlike any of the communities of practice described in the aforementioned literature. Wiley claims such decentralised learning communities have proven successful 'in the wild' and that the Internet provides multiple examples of ones that operate on a large scale (i.e. over 30 000 people). As far as IT-related practice is concerned this claim may be true (although we should bear in mind Preece's [2000] observation that Internet communities can grow very large very quickly but then disappear almost as fast), but examples of similarly distributed collective learning in other domains than IT are not very easy to find. Similar kinds of practices of internal control can be found in online communities of practice operating in other branches of the information industry, such as journalism (an example is the Urban Mag online journalists' collective based at the University of Ghent in Belgium), where there is a reflexive connection between the means and the purpose of the community's interaction. There are also commerce-oriented Internet communities organised around the marketing and consumption of specific brands and products (Hagel & Armstrong, 1997; Werry, 2001), self-help groups that have developed around issues such as health and social welfare (Preece, 2000; Burrows & Nettleton, 2002) and diaspora communities such as the one that formed in response to the bombing of Serbia in 1997 (Nolan & Weiss, 2002). But although these are all examples of relatively autonomous collectives engaged in sharing knowledge online, they do not resonate with the notion of the virtual learning community in the same way that Wiley's decentralised IT-focused examples do, either because the participants are not engaged in developing practices which are predominantly virtual, or because there is no real collective enterprise, or shared repertoire, or because the system of internal control is not owned by the community itself. The commercial communities' systems of participant control, for example, are often little more than cosmetic, with the power to direct or exclude resting mainly with the sponsoring organisations (Werry, 2001, p. 20). The activities of the self-help groups are highly individualised rather than community oriented and their membership boundaries are blurred (Burrows & Nettleton, 2002, pp. 264–265).

And diaspora communities' interconnections are more often overlaid on relationships that already exist in the physical world (Meredyth *et al.*, 2002; Nolan & Weiss, 2002, p. 303).

Thus it would seem that, even in the deregulated context of the Internet at large, genuinely autonomous learning communities that have 'deconstructed the overarching educational superstructure by decentralising control' (in Wiley's [2002, p. 21] words) are relatively rare, and tend to be confined to areas of practice which are reflexively concerned with information and technology itself. But how far does this kind of social shaping, through pre-existing purposes, external control, blurred boundaries, etc. impact on virtual learning communities in other domains, such as formal education, professional development, civic community? Online learning in the educational sector is sometimes represented, as we have seen, as an expression of a commitment to collaborative knowledge construction (Wallace, 2003), or to the pedagogical metaphor of learning-as-participation (Sfard, 1998), but Wiley's view of the conventional online course as 'an asymmetric power structure perpetuating authoritative voices which prevent the construction of new knowledge' (Wiley, 2002, p. 24) is a recognition of a different kind of social reality. Is the move towards virtual community in these domains a step towards more democratic institutions, or is it simply making entrenched authority structures less visible?

Online Courses

With a few early exceptions (e.g. Duin & Hansen, 1994) the literature on the formation of community in online classes tends not to focus on the wider institutional context, but instead to emphasise subjective and affective elements such as 'feelings of connectedness' and 'commonality of learning expectations' (Rovai, 2002), 'delight' (Ramondt & Chapman, 1998), 'camaraderie' (Brown, 2001), 'social presence' (Rourke *et al.*, 2001; Swan, 2002). These foci are in line with the identification of community with communication. Jones (2002, p. 372) talks of a 'particularly American tendency to substitute communication for tradition' but the discourse of communication-as-community is widespread in the online learning literature in Europe and Australasia too.

It is clear that groups in formal learning environments—courses offered for credit—have substantially different characteristics from voluntary, special interest communities on the Internet, not least because they tend to last for a limited and predetermined period of time. As Wallace points out, 'relationships in online courses are short-lived and somewhat involuntary' (Wallace, 2003, p. 265). The formal, institutional setting also shapes the ways that these relationships are mediated, to a considerable degree. Cole, in his forward to Renninger and Shumar's edited collection (2002), notes the hybridity of the 'web-mediated, book-mediated, institutionally constructed and constrained forms of interaction that are talked about in terms of virtual community', and urges the reader to pay attention to failures reported in the literature, as well as to the successes (Cole, 2002, p. xxviii). The metaphor of learning-as-participation, just like the critique of community-as-sentiment discussed earlier, predicts degrees of marginalisation and even exclusion as well as learning

and the development of identities of participation (Lave & Wenger, 1991; Wenger, 1998). The practices of virtual community in formal education are shaped by those of the non-virtual institutions which host them (discipline based, credit-awarding), which are designed to exclude as much as to embrace. It may be argued that the preoccupation with ideological, pedagogical and technological aspects of educational interaction in online environments has tended to obscure the basis that this interaction has in much more established practices owed to institutional and disciplinary traditions (Lea, 2004). There is evidence, for example, that literacy practices imported from wider social contexts, such as business training or popular media, shape interaction in online learning communities in higher education and are implicated in struggles for dominance amongst participants (Goodfellow, 2004).

Furthermore, contributors to Werry and Mowbray's (2001) critique of the rhetoric and reality of online communities in commerce, education and the 'alternative' (non-profit) sector make the point that commercial values have penetrated the practices of both corporate-sponsored and public-educational online communities, substituting advertising and the market orientation of commercial ownership for the volunteerism and 'gift-economy' traditions of the Internet (Werry, 2001, p. 21). Increasingly, the costs of recreating the complex social practices of schools and universities online is leading to the outsourcing of the technical delivery of many of the services that these institutions provide to their learning communities, e.g. web sites, e-mail accounts, class registration, etc. As Clark (2001) details, the academic communities of many North American schools and universities are now so thoroughly imbued with the marketing practices of their corporate sponsors, for example, the embedding of advertisements in web pages and e-mails, that it is becoming harder and harder for students to distinguish between products of the academic community that can be bought, like educational DVDs, and those that can't, like qualifications. Through the commercialisation of institutions, online courses become commodities and the interactions of their communities are reshaped (Clark, 2001, p. 138).

Professional Development Communities

Researchers in the field of corporate training and professional development have also addressed the tension between institutional and interactional priorities. For example, studies of corporately based online communities (Cothrel & Williams, 1999) have found that these are extremely susceptible to 'interference' from above, including attempts to exercise leadership by discouraging social or off-topic discussion, which in an online environment is as public as the business-to-hand. This may be one of the reasons why these studies found that regular active contributors seldom amounted to more than 15% of the nominal members of these groups despite the considerable organisational effort required to launch and sustain them as communities (Cothrel & Williams, 1999, p. 57). Practice in a corporate or professional context is often closely bound up with informal and casual engagement between colleagues, chance encounters, spontaneous conversation and observation, so the question arises whether a virtual environment can provide for such contingent

types of interaction. Investigations into the differences between a community of practice that exists in the physical environment and one that exists online have suggested that it is not sufficient simply to reproduce face-to-face communication characteristics in electronic form; online discussion, telephone and e-mail may not meet the community of practice need for situatedness in communication (Hildreth *et al.*, 1998). It may be that virtual interaction alone does not provide for participation rich enough to support the 'tuning of the joint enterprise' (Wenger, 1998, p. 95) which is essential to the idea of learning in practice, as Rocco *et al.* (2001) suggest with regard to the role of emotional trust in supporting local over distance work collaborations. Certainly the time taken by a group of learners working together online to become a learning community appears longer than it is for their situated equivalents, and is far more than is available in most cohort-based educational contexts (the Cothrel and Williams studies referred to above found that most of the business-related online communities they surveyed survived for 2–5 years).

Large-scale, and sustained, learning communities in the educational domain which are engaged in practice in the sense that we have discussed, are to be found in teacher professional development. Researchers have investigated such communities in a number of contexts, including the Learning Schools Programme (Leach, 2002) and National College for School Leadership (NCSL) (Russell & Thompson, 2002) in the UK, and the Inquiry Learning Forum (ILF) (Barab *et al.*, 2001) and Tapped In Project (Schlager *et al.*, 2002) in the USA. All these initiatives seem to have set out initially with the explicit aim of 'creating' virtual learning communities in order to transform practice in both the education and development of professional teachers and the everyday business of running schools and teaching children. In some cases the underlying assumption was that the technology would impact on practice in a dramatic and positive way; two of the NCSL developers, for example, expressed the hope that the virtual environment would 'remake the daily rhythms of professional life and transform that practice' (Russell & Thompson, 2002). There is also evidence of the ideological strand discussed earlier in the Tapped In Project, which was explicitly conceived in the belief that communities of practice work best as catalysts for innovation and learning when they exist outside the institutional controls and constraints of individual organisations (Schlager *et al.*, 2002, p. 132). All four initiatives have, in the light of a few years' experience, adapted their expectations of how their virtual communities should function, and what they might achieve. In particular, they have had to develop a better understanding of their own practice, and the way it shapes, and is shaped by, its physical and virtual settings.

This is perhaps best summed up by the experience of the ILF authors in trying to create a virtual equivalent of the practice of observing teachers at work in the classroom. It was done through online discussion of video samples of teachers at work, and following Preece's guidelines on creating policies and structures that support the community's shared purpose and social interactions (Preece, 2000), the virtual environment was designed to support what the developers thought these were. They included structures that supported group collaboration and work (e.g. collaborative design and preparation of lesson plans); structured tasks for engagement (teachers post their own questions about teaching which are linked to

contributors' reflections and to a specific discussion space); visible connections to people and artefacts in the environment (e.g. workrooms for existing working circles to use for their artefact-building). They also established three levels of membership (observer, active community member, contributing member) and created the roles of leader, critical friend, and reviewer, for community members to take on in order to provide leadership in discussion. Despite this principled approach, Barab *et al.* (2001) observe that, over a period of a year, it failed to generate anything like a real community of teacher-users. Many teachers did not feel encouraged to participate, could not develop social relationships and felt uncomfortable with the basic idea of criticising other teachers' practice. Furthermore, tensions emerged over the sharing of 'everyday' as opposed to 'expert' practice. These came to light in argument over the content of some of the videos, which appeared to show 'bad science' being taught, even though the focus was supposedly on the approach to teaching not on the subject knowledge per se.

Despite their rigorous theorising and inventive design, the ILF authors believe that their commitment to community may actually have been a 'hurdle' because the culture of teachers sharing pedagogical practice is simply not well established enough. The requirements of community are not satisfied by simply providing instances of exemplary classroom practice, but demand opportunities to share, reflect on and discuss actual practice, and, crucially, for the community to own itself and develop its own directions. Most significantly, Barab *et al.* (2001) point out that their most active contributors were those who already had a structured commitment (e.g. in pre-service teacher classes or projects). In order to build trust amongst the other participants, they suggest the need for face-to-face contact and the development of other non-virtual means (including financial) to support teachers in their participation. This conclusion relating to the reciprocal shaping of online community and embodied practice is echoed by Schlager *et al.* (2002) for the Tapped In Project. These authors argue that the benefits of new technologies accrue only after the technology has been effectively assimilated, a process that often involves the introduction of significant structural changes within the adopting organisation (Schlager *et al.*, 2002, p. 153).

The interdependence of virtual and physical aspects of these professional development communities, and the key role of contextualised practice in shaping them, points up the role that a pre-existent sense of 'local' community can play in the establishment of a sustainable 'distributed' community through online participation. But there is a tension between the need for local autonomy (if a genuine community of practice is to develop through virtual connection), and the need to manage this development in order to serve institutional or organisational goals.

Civic Learning Communities

The building of virtual civic communities, via the large-scale electronic networking of small place-based groups, has been seen as a means of addressing both educational and social welfare needs through the strengthening of local commitment to the development of community problem-solving competence (Schuler, 2001, p. 293).

The close interrelation between the operation of the 'digital divide' and other forms of social inequality also foregrounds the reciprocal nature of the shaping relation between technologies and social practices. However, the architects of virtual civic community warn against simplistic claims about the democracy and autonomy of electronic communities (Schuler, 2001). Studies of the effects of 'wiring' disadvantaged local communities (Meredyth *et al.*, 2002; Ferlander, 2003) underline the complexity of individual and group responses. They find that electronic networking creates high expectations of opportunities for self and community development. However, virtual community is not necessarily created in the form of an extension or deepening of ties amongst disparate groups sharing the same physical environment, but rather through the development of 'personal communities', e.g. individuals' connections to diasporic groups (Meredyth *et al.*, 2002) or to others sharing a face-to-face context for the use of the technology, e.g. an Internet café (Ferlander, 2003). There is a growing body of research suggesting that there is a positive symbiotic effect within the interrelationship of local communities, the Internet and sociability, in particular 'the ability to combine face-to-face interaction and local activism with the individuality and flexibility of the online environment' (Foth, 2003). But, like the effort to enhance learning through virtual communities in the educational sector, the project to address social and educational inequality through electronic networks also needs to take a critical view of the processes and practices through which social relations in the physical world are reproduced in the virtual realm.

Conclusion

The number of recent publications addressing research and development issues involved in building online learning communities testifies to the extent of current interest in combining virtuality and community in education. However, a conflation of community with communication, inherited from the literature on building virtual communities, has led to a focus on online learning activity as personal interaction rather than as social practice. A consequence of this is that the role of pre-existing located, and institutional, educational communities in shaping this virtual activity remains hidden, and the ideological bases of engagement and the role of social practice in including or excluding different kinds of participant are also obscured. Thus the narratives of democracy and personal freedom exist side by side with the practices of compelling participation in many online classrooms, and the rhetoric of a mutual learning enterprise is used to legitimise corporate self-interest in many business and commercial communities.

Educators have a responsibility to ensure that the ideologies that motivate the creation of virtual educational communities reflect an awareness of the located social realities of participants, the marginal as well as the core (Bitterman, 2000, pp. 33–34). For this to happen, the 'building communities' agenda which has underpinned many of the accounts discussed here, and which has focused on the subjective dimension of sociability and the experience of participation, needs to be informed by a 'shaping' perspective which foregrounds the bi-directionality of the relation between the technical design of an environment and the social practice it

has been developed to support. The kinds of social practice which characterise virtual educational environments, and through which community is co-constructed, are a mix of institutional and informal manifestations of the 'objective' characteristics of virtual community discussed earlier, and the localised practices of the embodied social groups to which participants belong. For example, established institutional practices in education, such as selection, assessment and accreditation, are all realised in formal online courses, and contribute to the shaping of 'goods' exchanged by participants (resources and advice for the passing of tests, feedback from teachers, interpretation of assessment criteria, comparison of grades, etc.). These practices also serve to define part of the communicative repertoire and to embed forms of social control. Whether they are explicitly discussed or not, they are as central to the experience of participation in the virtual educational community as they are in its physical equivalent. At the same time, informal practices deriving from the increased use of Internet-researched information contribute to the undermining of traditional sources of authority and expertise (Burrows & Nettleton, 2002). This leads to new forms of status and symbols of social capital, such as the referencing of peer-group online discussion that some students employ in their assignments (Lea, 2001), or to challenges to traditional forms of academic control, such as the plagiarising of obscure sources found on the Internet. Similarly, the tendency of Internet communities to form round media or technology-related activity is reproduced in educational contexts, through the increased importance given to the performance of mediated communication and the mastery of the repertoire of online groupwork, collaborative learning, etc. in place of more conventional demonstrations of knowledge of subject matter. Furthermore, the examples from corporate and professional development contexts, and from networked civic communities, show that attempts to simply 'virtualise' existing embodied practice in order to gain the advantages of flexibility and individualisation may fail to encompass the complexity of social relations that face-to-face or other mediated forms of interaction embody. In these conditions, a focus on interaction as the germinator of community obscures the role of contextualised social practice in constructing the meaning and significance of activities and events, at both individual and collective levels.

In order to further investigate the shaping of virtual educational communities through an examination of practice, we need to be able to represent activities and events in both physical and virtual contexts in comparable form. One way to approach this might be by viewing the practices in question as textually mediated (Barton, 2001) and exploring how the common and fundamental activities of reading and writing are used in both offline and online contexts to create and sustain engagement at the level of community. This means exploring the role of literacies in the creation of meaning and value, the exchange of goods, the conferring of status, the inclusion and exclusion of participants, in both the print and digital productions of the community.

There are few indications that much research of this type is currently going on (some examples are discussed in Goodfellow, 2004). However, there are indications of a growing interest in analysing the productions of online classrooms as both

language and social practice, as evidenced by the work of Anagnostopoulos *et al.* (in press), Cavalcanti & Bizon (2004), Lea (2001, 2004), McKenna (2005), Goodfellow *et al.* (2004). However it is achieved, a representation of how educational communities actively shape the social and technical conditions of their virtual interaction, as well as being shaped by it, would be an important contribution to resisting the global commodification of learning that current trends appear to predict.

Correspondence: Robin Goodfellow, Institute of Educational Technology, Open University, Milton Keynes MK7 6AA, UK; e-mail: r.goodfellow@open.ac.uk

REFERENCES

- ANAGNASTOPOLOUS, D., BASMADJIAN, K. & MCCRORY, R. (in press) Teaching and the construction of social space in the virtual classroom, *Teachers College Record*.
- BARAB, S.A. & DUFFY, T.M. (2000) From practice fields to communities of practice, in: D. JONASSEN & S. LAND (Eds) *Theoretical Foundations of Learning Environments*, pp. 25–55 (Mahwah, NJ, Lawrence Erlbaum Associates).
- BARAB, S.A., MAKINSTER, J., MOORE, J., CUNNINGHAM, D. & If DESIGN TEAM (2001) Designing and building an online community: the struggle to support sociability in the inquiry learning forum, *Educational Technology Research and Development*, 49, pp. 71–96.
- BARTON, D. (2001) Directions for literacy research: analysing language and social practices in a textually mediated world, *Language and Education*, 15, pp. 92–131.
- BAYM, N. (1998) The emergence of online community, in: S.G. JONES (Ed.) *CyberSociety 2.0: revisiting computer-mediated communication and community*, pp. 35–68 (Thousand Oaks, CA, Sage).
- BITTERMAN, J. (2000) Learning communities, in: V. MARSICK, J. BITTERMAN, R. VAN DER VEEN (Eds) *From the Learning Organisation to Learning Communities—toward a Learning Society*, ERIC Information Series No. 382, online at <http://www.crete.org/acve/docs/marsick/marsick1.pdf> (accessed February 2004).
- BONK, C. & KING, K. (Eds) (1998) *Electronic Collaborators* (London, Lawrence Erlbaum Associates).
- BROWN, R. (2001) The process of community-building in distance learning classes, *Journal of Asynchronous Learning Networks*, 5, online at http://www.aln.org/publications/jaln/v5n2/v5n2_brown.asp (accessed July 2005).
- BURBULES, N.C. (2000) Does the Internet constitute a global educational community?, in: N.C. BURBULES & C. TORRES (Eds) *Globalisation and Education: critical perspectives*, pp. 323–356 (London, Routledge).
- BURROWS, R. & NETTLETON, S. (2002) Reflexive modernisation and the emergence of wired self-help, in: K.A. RENNINGER & W. SHUMAR (Eds) *Building Virtual Communities: learning and change in cyberspace*, pp. 249–268 (Cambridge, Cambridge University Press).
- CAVALCANTI, M. & BIZON, A.C. (2004) At least we're all in the same boat: online learning as a turbulent journey, in: I. SNYDER & C. BEAVIS (Eds) *Doing Literacy Online: teaching, learning and playing in an electronic world*, pp. 69–90 (Cresskill, NJ, Hampton Press).
- CLARK, N. (2001) Education, communication, and consumption: piping in the academic community, in: C. WERRY & M. MOWBRAY (Eds) *Online Communities: commerce, community action and the virtual university*, pp. 129–148 (Upper Saddle River, NJ, Prentice Hall).
- COLE, M. (2002) Foreword: Virtual communities for learning and development—a look to the past and some glimpses into the future, in: K.A. RENNINGER & W. SHUMAR (Eds) *Building Virtual Communities: learning and change in cyberspace*, pp. xxi–xxix (Cambridge, Cambridge University Press).
- COOPER, G., GREEN, N., MURTAGH, G.M. & HARPER, R. (2002) Mobile society? Technology, distance, and presence, in: S. WOOLGAR (Ed.) *Virtual Society? Technology, Cyberbole, Reality*, pp. 286–301 (Oxford, Oxford University Press).
- COTHREL, J. & WILLIAMS, R. (1999) On-line communities: helping them form and grow, *Journal of Knowledge Management*, 3, pp. 54–60.
- CROW, G.P., ALLAN, G.A. & SUMMERS, M. (2001) Changing perspectives on the insider/outsider distinction in community sociology, *Community, Work and Family*, 4, pp. 29–48.

- DIKSHIT, H.P., GARG, S., PANDA, S. & VIJAYSHRI, (Eds) (2002) *Access & Equity: challenges for open and distance education* (New Delhi, Kogan Page).
- DOHENY-FARINA, S. (1996) *The Wired Neighbourhood* (New Haven, CT, Yale University Press).
- DREYFUSS, H.L. (2001) *On the Internet*, Thinking in Action Series (London, Routledge).
- DUIN, A.H. & HANSEN, C. (1994) Reading and writing on computer networks as social construction and social interaction, in: C. SELFE & S. HILLIGLOSS (Eds) *Literacy & Computers*, pp. 89–112 (New York, The Modern Language Association of America).
- FERLANDER, S. (2003) The Internet, social capital and local community, unpublished Ph.D. thesis, University of Stirling, online at <http://www.crdlt.stir.ac.uk/Docs/SaraFerlanderPhD.pdf> (accessed February 2004).
- FOTH, M. (2003) Connectivity does not ensure community: on social capital, networks and communities of place, *5th International conference on Information Technology in Regional Areas (ITiRA)*, Caloundra, online at http://www.mobilecommunitydesign.com/research/Foth-Connectivity_does_not_ensure_community-on_social_capital-networks_and_communities_of_place.pdf (accessed February 2004).
- GARRISON, R. & ANDERSON, T. (2003) *E-Learning in the 21st Century: a framework for research and practice* (London, RoutledgeFalmer).
- GOODFELLOW, R. (2004) Online literacies and learning: operational, cultural and critical dimensions, *Language and Education*, 18, pp. 379–399.
- GOODFELLOW, R., MORGAN, M., LEA, M. & PETTIT, J. (2004) Students writing in the virtual university: an investigation into the relation between online discussion and writing for assessment on two Masters courses, in: I. SNYDER & C. BEAVIS (Eds) *Doing Literacy Online: teaching, learning and playing in an electronic world*, pp. 25–44 (Cresskill, NJ, Hampton Press).
- GOODMAN, P. (1964) *Compulsory Mis-education and the Community of Scholars* (London, Random House).
- GROSSMAN, P., WINEBURG, S. & WOOLWORTH, S. (2001) Toward a theory of teacher community, *Teachers College Record*, 103, pp. 942–1012.
- GUNAWARDENA, C. (1995) Social presence theory and implications for interaction and collaborative learning in computer conferences, *International Journal of Educational Telecommunications*, 1, pp. 147–166, online at <http://dl.aace.org/9284> (accessed July 2005).
- HAGEL, J. & ARMSTRONG, A. (1997) *Net Gain. Expanding Markets through Virtual Communities* (Boston, MA, Harvard Business School Press).
- HAKKEN, D. (2002) Afterword: Building our knowledge of virtual community: some responses, in: K.A. RENNINGER & W. SHUMAR (Eds) *Building Virtual Communities: learning and change in cyberspace*, pp. 355–367 (Cambridge, Cambridge University Press).
- HAMMAN, R. (2001) Computer networks linking network communities, in: C. WERRY & M. MOWBRAY (Eds) *Online Communities: commerce, community action and the virtual university*, pp. 71–91 (Upper Saddle River, NJ, Prentice Hall).
- HARASIM, L. (1993) Networkds: networks as social spaces, in: L. HARASIM (Ed.) *Global Networks: computers and international communication*, pp. 15–34 (Cambridge, MA, MIT Press).
- HAWISHER, G. & SELFE, C. (2000) *Global Literacies and the World Wide Web* (London, Routledge).
- HAYTHORNTHWAITE, C. (2002) Building social networks via computer networks: creating and sustaining distributed learning communities, in: K.A. RENNINGER & W. SHUMAR (Eds) *Building Virtual Communities: learning and change in cyberspace*, pp. 159–190 (Cambridge, Cambridge University Press).
- HERRING, S. (2001) Computer-mediated discourse, in: D. TANNEN, D. SCHIFFRIN & H. HAMILTON (Eds) *The Handbook of Discourse Analysis*, pp. 612–634 (Oxford, Blackwell).
- HILDRETH, P.M., KIMBLE, C. & WRIGHT, P. (1998) Computer mediated communications and international communities of practice, presented at *Ethcomp98*, Erasmus University, Netherlands.
- HILTZ, S.R. (1994) *The Virtual Classroom: learning without limits via computer networks* (Norwood, NJ, Ablex).
- HODGSON, V. & REYNOLDS, M. (2002) Networked learning and ideas of community, in: S. BANKS, P. GOODYEAR, V. HODGSON & D. MCCONNELL (Eds) *Proceedings of the Third International Conference on Networked Learning*, University of Sheffield, online at <http://www.shef.ac.uk/nlc2002/proceedings/index.htm> (accessed August 2003).
- ILLICH, I. (1976) *Deschooling Society* (Harmondsworth, Penguin).
- JONES, S.G. (1998) Information, Internet, and community: notes toward an understanding of community in the information age, in: S. JONES (Ed.) *CyberSociety 2.0: revisiting computer-mediated communication and community*, pp. 1–34 (Thousand Oaks, CA, Sage).

- JONES, S.G. (2002) Afterword: Building, buying, or being there: imagining online community, in: K.A. RENNINGER & W. SHUMAR (Eds) *Building Virtual Communities: learning and change in cyberspace*, pp. 368–376 (Cambridge, Cambridge University Press).
- KOLLOCK, P. (1999) The economies of online co-operation: gifts and public goods in cyberspace, in: M. SMITH & P. KOLLOCK (Eds) *Communities in Cyberspace*, pp. 220–242 (London, Routledge).
- LALLY, V. & BARRETT, E. (1999) Building a learning community online: towards socio-academic interaction, *Research Papers in Education*, 14, pp. 147–164.
- LAVE, J. (1993) Situated learning in communities of practice, in: L.B. RESNICK, J. LEVINE & S.D. TEASLEY (Eds) *Perspectives on Socially Shared Cognition*, pp. 63–82 (Washington, DC, American Psychological Association).
- LAVE, J. & WENGER, E. (1991) *Situated Learning: legitimate peripheral participation* (Cambridge, Cambridge University Press).
- LEA, M. (2001) Computer conferencing and assessment: new ways of writing in higher education, *Studies in Higher Education*, 26, pp. 163–181.
- LEA, M. (2004) New literacy studies, ICTs and learning in higher education, in: I. SNYDER & C. BEAVIS (Eds) *Doing Literacy Online: teaching, learning and playing in an electronic world*, pp. 3–24 (Cresskill, NJ, Hampton Press).
- LEACH, J. (2002) The curriculum knowledge of teachers: a review of the potential of large-scale, electronic conference environments for professional development, *The Curriculum Journal*, 13, pp. 82–120.
- LEANDER, K. & DUNCAN, B. (2004) Community construction in the virtual: reconceptualising joint action, *E-Learning*, 1, online at http://www.worlds.co.uk/elea/content/pdfs/1/issue1_3.asp (accessed July 2005).
- MCCLLENAGHAN, P. (2000) Social capital: exploring the theoretical foundations of community development education, *British Educational Research Journal*, 26, pp. 565–582.
- MCKENNA, C. (2005) Words, bridges and dialogue: issues of audience and addressivity in online communication, in: S. BAYNE & R. LAND (Eds) *Issues in Cyberspace Education*, pp. 91–104 (London, Routledge).
- MARSH, C. & RICHARDS, K. (2001) Social inclusion and professional development: communities of learners—raising some questions, *Journal of In-service Education*, 27, pp. 447–463.
- MEREDYTH, D., HOPKINS, L., EWING, S. & THOMAS, J. (2002) Measuring social capital in a networked housing estate, *First Monday*, 7, online at http://firstmonday.org/issues/issue7_10/meredyth/index.html (accessed February 2004).
- MERRYFIELD, M. (2003) Like a veil: cross-cultural experiential learning online, *Contemporary Issues in Technology and Teacher Education*, 3, pp. 146–171.
- MOODLEY, S. (2002) Inclusive education: challenges for distance learning, *Policy and Practice, Pathways 6 Conference*, Sydney, online at <http://www.tsa.ac.za/saada/papers/Moodley.pdf> (accessed July 2005).
- MOZZON-MCPHERSON, M. (1998) Electronically Italians: effectiveness and limitations of the use of Internet for language learning and cultural understanding, in: D. KILLICK & M. PARRY (Eds) *Cross-cultural Capability*, pp. 112–123 (Leeds, Leeds Metropolitan Press).
- NOLAN, D.J. & WEISS, J. (2002) Learning in cyberspace: an educational view of virtual community, in: K.A. RENNINGER & W. SHUMAR (Eds) *Building Virtual Communities: learning and change in cyberspace*, pp. 293–320 (Cambridge, Cambridge University Press).
- PALOFF, R.M. & PRATT, K. (1999) *Building Learning Communities in Cyberspace* (San Francisco, CA, Jossey-Bass).
- PREECE, J. (2000) *Online Communities: designing usability, supporting sociability* (Chichester, John Wiley & Sons).
- RAMONDT, L. & CHAPMAN, C. (1998) Online learning communities, Ultralab Paper, online at http://www.ultralab.ac.uk/papers/online_learning_communities (accessed February 2004).
- RENNINGER, K.A. & SHUMAR, W. (Eds) (2002) *Building Virtual Communities: learning and change in cyberspace* (Cambridge, Cambridge University Press).
- RHEINGOLD, H. (1993) *The Virtual Community: homesteading on the electronic frontier* (New York, Addison-Wesley), also online at <http://www.rheingold.com/vc/book> (accessed March 2003).
- ROCCO, E., FINHOLT, T. & HOFER, E. (2001) Out of sight, short of trust, Collaboratory for Research on Electronic Work, Technical Report Number: CREW-01-10, online at <http://www.crew.umich.edu/publications/01-10.pdf> (accessed July 2005).
- ROURKE, L., ANDERSON, T., GARRISON, D.R. & ARCHER, W. (2001) Assessing social presence in asynchronous text-based computer conferencing, *Journal of Distance Education*, 14, pp. 51–71.

- ROVAI, A. (2002) Building sense of community at a distance, *International Review of Research in Open and Distance Learning*, April, online at <http://www.irrodl.org/content/v3.1/rovai.html> (accessed August 2003).
- RUSSELL, A. & THOMPSON, K. (2002) Talking heads—its progress—transfer to Wales and Scotland and relevance to the Republic of Ireland, presented at *Association for Information Technology in Teacher Education Conference*, Trinity College Dublin, July.
- RUSSELL, M. (1999) Online learning communities: implications for adult learning, *Adult Learning*, 10, pp. 28–31.
- RUSSELL, S. & WILLIAMS, R. (2002) Social shaping research and technology policy: themes and insights from recent work, presented at *Sino-European Symposium on Science, Technology and Society*, Chinese Academy of Social Sciences, Beijing, 16–17 September, online at <http://www.uow.edu.au/arts/staff/russell/beijingpaper.pdf> (accessed July 2005).
- SCHLAGER, M., FUSCO, J. & SCHANK, P. (2002) Evolution of an on-line education community of practice, in: K.A. RENNINGER & W. SHUMAR (Eds) *Building Virtual Communities: learning and change in cyberspace*, pp. 129–158 (Cambridge, Cambridge University Press).
- SCHULER, D. (2001) What kind of platform for change? Democracy, community work and the Internet, in: C. WERRY & M. MOWBRAY (Eds) *Online Communities: commerce, community action and the virtual university*, pp. 281–295 (Upper Saddle River, NJ, Prentice Hall).
- SFARD, A. (1998) On two metaphors for learning and the dangers of choosing just one, *Educational Researcher*, 27, pp. 4–13.
- SHIELDS, C.M. & SELTZER, P. (1997) Complexities and paradoxes of community: toward a more useful conceptualization of community, *Educational Administration Quarterly*, 33, pp. 413–439.
- SWAN, K. (2002) Building learning communities in online courses: the importance of interaction, *Education, Communication and Information*, 2, pp. 23–49.
- URBAN MAG JOURNALISTS' COLLECTIVE: [HTTP://WWW.URBANMAG.BE](http://www.urbanmag.be)
- VOYDANOFF, P. (2001) Conceptualizing community in the context of work and family, *Community, Work and Family*, 4, pp. 133–156.
- WALLACE, R. (2003) Online learning in higher education—a review of research on interactions among teachers and students, *Education, Communication and Information*, 3, pp. 241–280.
- WELLMAN, B. & GULIA, M. (1999) Virtual communities as communities: Net surfers don't ride alone, in: M. SMITH & P. KOLLOCK (Eds) *Communities in Cyberspace*, pp. 167–194 (London, Routledge).
- WENGER, E. (1998) *Communities of Practice* (Cambridge, Cambridge University Press).
- WERRY, C. (2001) Imagined electronic community: representations of virtual community in business texts, in: C. WERRY & M. MOWBRAY (Eds) *Online Communities: commerce, community action and the virtual university*, pp. 3–32 (Upper Saddle River, NJ, Prentice Hall).
- WERRY, C. & MOWBRAY, M. (Eds) (2001) *Online Communities: commerce, community action and the virtual university* (Upper Saddle River, NJ, Prentice Hall).
- WILEY, D. (2002) The coming collision between automated instruction and social constructivism, online at http://telr-research.osu.edu/learning_objects/documents/wiley.pdf (accessed January 2003).
- WILSON, B. (2001) Sense of community as a valued outcome for electronic courses, cohorts and programs, online at <http://www.pt3.org/VQ/html/wilson.html> (accessed January 2003).
- WILSON, B. & RYDER, M. (1996) Dynamic learning communities: an alternative to designed instructional systems, online at <http://carbon.cudenver.edu/~mryder/dlc.html>
- WOOLGAR, S. (2003) Social shaping perspectives on e-science and e-social science: the case for research support, Consultative Study for the Economic and Social Research Council, online at <http://www.virtualsociety.org.uk> (accessed July 2005).